

## PATENT ABSTRACTS OF JAPAN

(11)Publication number : 09-134240

(43)Date of publication of application : 20.05.1997

(51)Int.Cl.

**G06F 3/00**

G06F 13/14

G06K 17/00

**(21)Application number : 07-289873**

(71)Applicant : TOSHIBA CORP

(22)Date of filing : 08.11.1995

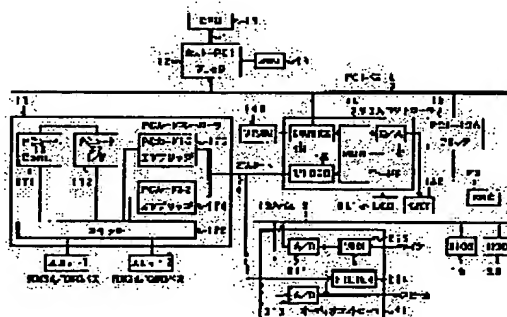
(72)Inventor : KOKUBO TAKASHI  
SAKAMOTO HIROYUKI

**(54) COMPUTER SYSTEM, PC CARD CONTROLLER AND PC CARD TO BE USED IN THE SYSTEM**

**(57)Abstract:**

**PROBLEM TO BE SOLVED:** To transfer video data using a ZV port even if a 16-bits PC card or a 32-bits PC card is connected.

**SOLUTION:** Two bridges 173 and 174 for the PC card 16 and for the PC card 32 are provided in a PC card controller 17, and they are suitably changed over by a switch circuit 175. Even if either the PC card 16 or the PC card 32 is connected to a card slot, video/audio data from the connected PC card can normally be transferred to the ZV port 4. Thus, the width of a bus band, which is enlarged by the ZV port 4, can effectively be used.



## LEGAL STATUS

**[Date of request for examination]**

**20.08.2001**

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

**\* NOTICES \***

JPO and NCIPJ are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

**CLAIMS**

---

**[Claim(s)]**

[Claim 1] A 16-bit PC card and a 32-bit PC card alternatively The card slot which can connect, The card controller which controls said 16-bit PC card or 32-bit PC card which was connected to the system bus and connected to said card slot, With the display controller who is connected to a system bus and has the display process function of a video data The audio controller which is connected to a system bus and carries out input/output control of the speech information, The video audio bus arranged between said card slot and said display controller, and the audio controller, So that the video / audio signal track group assigned to predetermined two or more pins of said 16-bit PC card may be connected respectively corresponding to the video / audio signal line of said video audio bus The 1st connecting means which connects to said video audio bus the PC card connected to said card slot according to the assignment of said video / audio signal line to said 16-bit PC card, So that the video / audio signal track group assigned to predetermined two or more pins of said 32-bit PC card may be connected respectively corresponding to the video / audio signal line of said video audio bus The 2nd connecting means which connects to said video audio bus the PC card connected to said card slot according to assignment of said video / audio signal track group to said 32-bit PC card, It responds to any of said 16-bit PC card and said 32-bit PC card the PC cards connected to said card slot are. The computer system characterized by providing the connection control means which controls connection between said PC card and said video audio bus, using alternatively said 1st and 2nd connecting means.

[Claim 2] Said 1st and 2nd connecting means and said connection control means are a computer system according to claim 1 characterized by being built in said card controller.

[Claim 3] A 16-bit PC card and a 32-bit PC card alternatively The card slot which can connect, The card controller which controls said 16-bit PC card or 32-bit PC card which was connected to the system bus and connected to said card slot, With the display controller who is connected to a system bus and has the display process function of a video data The audio controller which is connected to a system bus and carries out input/output control of the speech information, The video audio bus arranged between said card controller and said display controller, and the audio controller is provided. Said card controller It is the 1st connecting means which connects said 16-bit PC card to said system bus and said video audio bus alternatively. So that the video / audio signal track group assigned to predetermined two or more pins of said 16-bit PC card may be connected respectively corresponding to the video / audio signal line of said video audio bus The 1st connecting means which connects to said video audio bus the PC card connected to said card slot according to the assignment of said video / audio signal line to said 16-bit PC card, So that the video / audio signal track group assigned to predetermined two or more pins of said 32-bit PC card may be connected respectively corresponding to the video / audio signal line of said video audio bus The 2nd connecting means which connects to said video audio bus the PC card connected to said card slot according to assignment of said video / audio signal track group to said 32-bit PC card, It responds to any of said 16-bit PC card and said 32-bit PC card the PC cards connected to said card slot are. The connection control means which controls connection with said PC card and said system bus, and a video audio bus, using

alternatively said 1st and 2nd connecting means is included. Said connection control means follows the address value specified by the light transaction performed by said 32-bit PC card. The computer system characterized by changing connection of said 32-bit PC card from said system bus to said video audio bus.

[Claim 4] In the card controller which controls the PC card by which the 16-bit PC card and the 32-bit PC card were alternatively connected to the card slot which can connect The video audio bus for connecting directly to a display controller and an audio controller the PC card connected to said card slot, It is the 1st connecting means which connects said 16-bit PC card to said video audio bus. So that the video / audio signal track group assigned to predetermined two or more pins of said 16-bit PC card may be connected respectively corresponding to the video / audio signal line of said video audio bus The 1st connecting means which connects to said video audio bus the PC card connected to said card slot according to the assignment of said video / audio signal line to said 16-bit PC card, So that the video / audio signal track group assigned to predetermined two or more pins of said 32-bit PC card may be connected respectively corresponding to the video / audio signal line of said video audio bus The 2nd connecting means which connects to said video audio bus the PC card connected to said card slot according to assignment of said video / audio signal track group to said 32-bit PC card, It responds to any of said 16-bit PC card and said 32-bit PC card the PC cards connected to said card slot are. The PC card controller characterized by providing the connection control means which controls connection between said PC card and said video audio bus, using alternatively said 1st and 2nd connecting means.

[Claim 5] In a 32-bit PC card connectable with the card slot of the computer which has a video audio bus for connecting to a display controller and an audio controller directly the PC card connected to the card slot Predetermined two or more pins in the pin group for a host interface prepared in said 32-bit PC card The 32-bit PC card characterized by sending data to said video audio bus by assigning said video audio bus as a video audio pin for carrying out data output, and carrying out data output through the video audio pin.

---

## DETAILED DESCRIPTION

---

### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the computer system which supports the both sides of a 16-bit PC card and a 32-bit PC card.

[0002]

[Description of the Prior Art] In recent years, a device with the slot of the PC card based on the standard specifications of PCMCIA (Personal Computer Memory Card International Association) and JEIDA which are an American standardization organization is spreading. Various development is made in order to use this PC card as the video capture card which performs input/output control of a video data, and an MPEG decoder card.

[0003] In order to process such a lot of data, in a personal computer, the system architecture using a PCI local bus is spreading. However, even if it uses a PCI local bus, there is a limitation in the data transfer capacity. For this reason, when using a PC card as a video capture card or an MPEG decoder card as mentioned above, the data transfer capacity of a PCI local bus is inadequate.

[0004]

[Problem(s) to be Solved by the Invention] So, recently, the bus only for animations called ZV (Zoomed Video) port is used, and the technique which carries out direct continuation of a PC card and the display controller is beginning to be developed. However, the conventional system with a ZV port is equivalent only to the 16-bit usual PC card, and a system and card side both does not have the structure which connects a 32-bit PC card (CardBus specification) to a ZV port. Therefore, when a 32-bit PC card was used, the pass band width of face extended by the ZV port was not able to be utilized effectively.

[0005] This invention was made in view of such a point, even when which of a 16-bit PC card and a 32-bit PC card is connected to a card slot, it enables it to connect it to an animation dedicated bus normally, and it aims at provide with a PC card the PC card controller list used by the computer system which can use effectively the pass band width of face by the type of a PC card expanded by the animation dedicated bus \*\*, and this system.

[0006]

[Means for Solving the Problem] A 16-bit PC card and a 32-bit PC card alternatively the computer system by this invention The card slot which can connect, The card controller which controls said 16-bit PC card or 32-bit PC card which was connected to the system bus and connected to said card slot, With the display controller who is connected to a system bus and has the display process function of a video data The audio controller which is connected to a system bus and carries out input/output control of the speech information, The video audio bus arranged between said card slot and said display controller, and the audio controller, So that the video / audio signal track group assigned to predetermined two or more pins of said 16-bit PC card may be connected respectively corresponding to the video / audio signal line of said video audio bus The 1st connecting means which connects to said video audio bus the PC card connected to said card slot according to the assignment of said video / audio signal line to said 16-bit PC card, So that the video / audio signal track group assigned to predetermined two or more pins of said 32-bit PC card may be connected respectively corresponding to the video / audio signal line of said video audio bus The 2nd connecting means which connects to said video audio bus the PC card connected to said card slot according to assignment of said video / audio signal track group to said 32-bit PC card, It responds to any of said 16-bit PC card and said 32-bit PC card the PC cards connected to said card slot are. It is characterized by providing the connection control means which controls connection between said PC card and said video audio bus, using alternatively said 1st and 2nd connecting means.

[0007] In this system, the 1st connecting means corresponding to a 16-bit PC card and the 2nd connecting means corresponding to a 32-bit PC card are established. These connecting means connect a PC card to a video audio bus according to assignment of the video / audio signal track

group to the card which corresponds, respectively. For this reason, even when which of a 16-bit PC card and a 32-bit PC card is connected to a card slot, by using the connecting means corresponding to that connected PC card, it can connect now with the video audio bus only for [ the connected PC card ] animations normally, and it becomes possible to use effectively the pass band width of face by the type of a PC card expanded by the animation dedicated bus \*\*.

[0008] [Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained with reference to a drawing. The configuration of the computer system concerning 1 operation gestalt of this invention is shown in drawing 1. This computer system is a portable computer the notebook type in which a dc-battery drive is possible, or laptop type, and the processor bus 1, internal PCI bus 2, internal ISA Bus 3, and ZV port 4 are formed on that system board. ZV port 4 is a video audio bus which carries out direct continuation of between a PC Card slot, a display controller 14, and the audio controllers 21 in a point-to-point format.

[0009] Moreover, on a system board, they are CPU11, the host / PCI bridge equipment 12, memory 13, a display controller 14, internal PCI-ISA bridge equipment 16, the PC card controller 17, and BIOS. ROM19, HDD20, the audio controller 21, the keyboard controller (KBC) 22, etc. are formed.

[0010] CPU11 is realized by the microprocessor "Pentium" currently manufactured and sold by U.S. Intel. The processor bus 1 directly linked with the I/O pin of this CPU11 has the data bus of 64-bit width of face.

[0011] Memory 13 is a memory device which stores the application program an operating system, a device driver, and for activation, processed data, etc., and is constituted by two or more DRAM modules. This memory 13 consists of a system memory beforehand mounted on a system board, and an expanded memory with which it is equipped by the user if needed. As a DRAM module which constitutes these system memories and an expanded memory, high speed storage [ need / a memory clock / to be supplied ] is used for every banks, such as a Synchronous DRAM and Rambus.

[0012] This memory 13 is connected to host-PCI bridge equipment 12 through the memory bus of dedication which has the data bus of 32-bit width of face or 64-bit width of face. The data bus of the processor bus 1 can also be used as a data bus of a memory bus. In this case, a memory bus consists of an address bus and various memory control signal lines.

[0013] HOSUTO PCI bridge equipment 12 is the bridge LSI which connects between the processor bus 1 and internal PCI buses 2, and functions as one of the bus masters of PCI bus 2. This host / PCI bridge equipment 12 have the function to change a bus cycle including data and the address in both directions, the function which carries out the access control of the memory 13 through a memory bus between the processor bus 1 and internal PCI bus 2.

[0014] Internal PCI bus 2 is the input/output bus of a clock synchronous type, and all the cycles on internal PCI bus 2 are performed synchronizing with a PCI bus clock. The frequency of a PCI bus clock is a maximum of 33MHz. PCI bus 2 has the address/data bus used in time sharing. This address/data bus are 32-bit width of face.

[0015] The data transfer cycle on PCI bus 2 consists of an address phase and one or more data phases which follow it. The address and a transfer type are outputted in an address phase, and data (8 bits, 16 bits, 24 bits, or 32 bits) are outputted in a data phase.

[0016] A display controller 14 is one of the bus masters of PCI bus 2 like a host / PCI bridge equipment 12, displays the image data of video memory (VRAM) 143 on CRT DIPUREI 142 of LCD141 or the exterior, and supports a movie display besides the text of a VGA specification, and a graphics display.

[0017] The graphics display-control circuit (Graphics) 144, the video presentation control circuit (Video) 145, the multiplexer 146, and the D/A converter 147 grade are prepared for this display controller 14 like illustration.

[0018] The graphics display-control circuit 144 is a graphics controller compatible with VGA, and changes and outputs the graphics data of VGA drawn by video memory (VRAM) 143 to a RGB video data. The video presentation control circuit 145 has the YUV-RGB conversion circuit which changes into a RGB video data the YUV data stored in the video buffer which stores the

digital YUV data transmitted through ZV port 4, and this buffer.

[0019] On the VGA graphics from selection or the graphics display-control circuit 144, a multiplexer 146 compounds the video outlet from the video presentation control circuit 145, and sends one side of the output data of the graphics display-control circuit 144 and the video presentation control circuit 145 at a color LCD 141 and D/A converter 147. D/A converter 147 changes the video data from a multiplexer 146 into the analog RGB signal, and outputs it to CRT display 142.

[0020] Internal PCI-ISA bridge equipment 16 is the bridge LSI which connects between internal PCI bus 2 and internal ISA Buses 3, and functions as one of the PCI devices. The PCI bus arbiter, the DMA controller, etc. are built in this internal PCI-ISA bridge equipment 16. In internal ISA Bus 3, it is BIOS. ROM19, HDD20, the audio controller 21, the keyboard controller 22, etc. are connected.

[0021] A/D converter 211 for the audio controller 21 performing input/output control of audio data to the bottom of control of CPU11, and carrying out A/D conversion of the sound signal from a microphone terminal, D/A converter 212 for outputting the digital audio data from CPU11 to a loudspeaker terminal as an analog signal, The filter circuit 214 which changes into an analog signal the digital audio data supplied from a PC card through ZV port 4, and is outputted to a loudspeaker terminal, It consists of multiplexers 213 which choose or output [ synthetic ] the sound signal from the output and microphone terminal from this filter circuit 214.

[0022] The PC card controller 17 is one of the PCI devices, controls the 16-bit PC card (PC card -16) of a PCMCIA specification, and the 32-bit PC card (PC card -32) of the CardBus specification under control of CPU11, and is also supporting the ZV port.

[0023] here — PC card -16 and PC card -32 — each interface is explained. Although both PC card -16 and PC card -32 have the interface of 68 pins, the assignment of a signal to these pins differs mutually. The correspondence relation of pin assignment between PC card -16 and PC card -32 is shown in drawing 2 and drawing 3 . As drawing 2 and drawing 3 show, it is assigned to the pin by which the addresses A0-A25 differ from data D0-D15 in PC card -16, respectively, and the data transfer units of PC card -16 are 16 bitwises. On the other hand in PC card -32, the address and data CAD0-CAD31 are assigned to the same pin, and the data transfer of 32 bitwises is possible.

[0024] The PC card controller 17 has two modes of operation, normal mode and ZV port mode. Normal mode is for controlling usual PC card -16 and usual PC cards -32, such as a modem card, data transfer is performed between PCI bus 2 and a PC card, and a ZV port does not use it.

[0025] ZV port mode is the mode used when the PC Card slot is equipped with the PC card treating animations, such as a video capture card and an MPEG decoder card. In this mode, the PC card controller 17 carries out transfer direct of the video data (digital YUV) and digital audio data which are transmitted from a PC card to a display controller 14 and the audio controller 21 through ZV port 4.

[0026] The change of a mode of operation is performed by CPU11 etc. That is, CPU11 reads attribute information in the PC card with which the PC Card slot is equipped, and detects the class of PC card with which it is equipped using the attribute information. If the PC card with which it is equipped is a card of ZV port correspondence, CPU11 will change the PC card controller 17 to ZV port mode.

[0027] The PC card interface in these normal modes and each ZV port mode is shown in drawing 4 and drawing 5 . Drawing 4 is the interface of PC card -16, and drawing 5 is the interface of PC card -32.

[0028] In PC card -16, the PC card interface which consists of 68 pins is used by normal mode according to the standard pin assignment rule specified by the PCMCIA specification as shown in drawing 4 . On the other hand, in ZV port mode, the address line (A25-A7) is used for the output of the digital YUV data from a PC card, or the output of a horizontal and a Vertical Synchronizing signal (HREF, VSYNC), and the I/O Port acknowledgement line (-INPACK) and audio output line (-SPKR) which were prepared as an object for I/O cards are used for the signal (LRCK) output the audio data (SDATA) output and the current audio data output from a PC card

indicate a left channel or a right channel to be.

[0029] Moreover, in PC card -32, the PC card interface which consists of 68 pins is used in normal mode according to the standard pin assignment rule specified by the CardBus specification as shown in drawing 5. On the other hand, in ZV port mode, the address/data line (CAD0-CAD15) is used for the output of the digital YUV data from a PC card, CAD 17 and 19 is used for the output of the horizontal and Vertical Synchronizing signal from a PC card (HREF, VSYNC), and CAD 21 and 22 and CAD 27 and 29 are used for the output of the audio data (SCLK, MCLK, LRCLK, SDATA) from a PC card.

[0030] The controller 171 for PC cards -16, the interface 172 for PC cards -32, the ZV bridge 173 for PC cards -16, the ZV bridge 174 for PC cards -32, and the switching circuit 175 are established in the PC card controller 17 as shown in drawing 1.

[0031] The controller 171 for PC cards -16 controls PC card -16 with which the card slot was equipped, in order to perform data transfer between PC cards -16 and PCI buses 2 with which the card slot was equipped. The interface 172 for PC cards -32 controls PC card -32 with which the card slot was equipped, in order to perform data transfer between PC cards -32 and PCI buses 2 with which the card slot was equipped. In this case, since the interface signal assigned to 68 pin connectors of PC card -32 is an equivalent for a PCI bus, the interface 172 for PC cards -32 controls only the signal transfer between PC card -32 and PCI bus 2 fundamentally.

[0032] The ZV bridge 173 for PC cards -16 is used in ZV port mode, and it connects PC card -16 to ZV port 4 according to the assignment of video / audio signal line to PC card -16 shown in drawing 4 so that the video / audio signal track group assigned to the interface of PC card -16 with which the card slot was equipped may be connected respectively corresponding to the video / audio signal track group of ZV port 4. According to the assignment of video / audio signal line to PC card -32 shown in drawing 5, PC card -32 is connected to ZV port 4 so that similarly the ZV bridge 174 for PC cards -32 may also be used in ZV port mode and the video / audio signal track group assigned to the interface of PC card -32 with which the card slot was equipped may be connected respectively corresponding to the video / audio signal track group of ZV port 4.

[0033] According to a type (PC card -16 or PC card -32), transfer mode (normal mode or ZV port mode), etc. of the PC card with which the card slot was equipped, the controller 171 for PC cards -16, the interface 172 for PC cards -32, the ZV bridge 173 for PC cards -16, and the ZV bridge 174 for PC cards -32 are used for a switching circuit 125, changing them alternatively.

[0034] As mentioned above, the pins to which video / audio signal line is assigned differ with PC card -16 and PC card -32. However, in the system of this operation gestalt, as mentioned above, two ZV bridges, the object for PC cards -16 and the object for PC card -32, 173, 174 are formed, and they are suitably changed by the switching circuit 175. For this reason, even when which of PC card -16 and PC card -32 is connected to a card slot, the video audio data from that connected PC card can be normally transmitted to ZV port 4.

[0035] The concrete configuration of the PC card controller 17 is shown in drawing 6. This PC card controller 17 corresponds to two card slots, the 1st and the 2nd, and the PCI-IO interface 176, the slot separator 178, the interface logic 179 for card slot 1, the interface logic 180 for card slot 2, the card IO interface 186 for card slot 1, and the card IO interface 187 for card slot 2 are established here like illustration.

[0036] The PCI-IO interface 176 is an I/O buffer used for the data transfer between PCI buses 2. Slot SEBARETA 178 chooses which slot is processed with change directions of CPU11.

[0037] In addition to the controller 171 for PC cards -16 which it is and was mentioned above, the interface 172 for PC cards -32, and switching circuit 175 for controlling the PC card connected to the 1st card slot, the interface logic 179 for card slot 1 is equipped with a multiplexer 181, the bridge 182 for PCI-PC cards 16, the bridge 183 for PCI-PC cards 32, the card interface data selection circuit 184, and the card DITEKUTO circuit 185.

[0038] A multiplexer 181 chooses the data from PC card -16, and the data from PC card -32 according to the detection result of the card DITEKUTO circuit 185. The bridge 182 for PCI-PC cards 16 controls the data transfer between PCI bus 2 and PC card -16. The bridge 183 for PCI-PC cards 32 controls the data transfer between PCI bus 2 and PC card -32. As mentioned



above, a switching circuit 175 performs change control for connecting the data from a PC card to ZV port 4 or PCI bus 2, and builds in two change circuits, the object for PC cards -16, and the object for PC card-32.

[0039] The card interface data select circuit 184 outputs the data from a PC card to the object for PC cards -16 of a switching circuit 175, or the change circuit for PC card-32 according to the detection result of the card DITEKUTO circuit 185. It judges whether the connected PC card is PC card -16, or the card DITEKUTO circuit 185 is PC card -32. This judgment is made based on the combination of the condition of four pins (a pin 67, a pin 36, a pin 57, pin 43) of the connected PC card.

[0040] The interface logic 180 for card slot 2 is for controlling the PC card connected to the 2nd card slot, and is constituted like interface logic 179.

[0041] Furthermore, the slot selector 188 which chooses one of two slots with the directions from CPU11, and is outputted to the ZV bridge 173 for PC cards -16, the slot selector 189 which chooses one of two slots with the directions from CPU11, and is outputted to the ZV bridge 174 for PC cards -32, and the controller 190 which controls the data-transfer protocol mentioned later are formed in the PC card controller 17.

[0042] Next, the protocol for the video audio data transfer from the PC card to the display controller 14 and the audio controller 21 which used ZV port 4 is explained.

[0043] [Card recognition] Here, the case where PC card -32 which constitutes a video capture card is used is illustrated and explained.

[0044] When PC card -32 which constitutes a video capture card is connected to the 1st card slot, it is detected by the card DITEKUTO circuit 185 of the interface logic 179 for card slot 1 that the connected card is PC card -32. The card interface data select circuit 184 connects PC card -32 to the change circuit for PC card-32 of a switching circuit 175 according to the detection result of the card DITEKUTO circuit 185. Moreover, a multiplexer 181 also chooses the bridge 183 for PCI-PC cards 32 according to the detection result of the card DITEKUTO circuit 185. Thereby, the pass between PC card -32 and PCI bus 2 is established, and CPU11 becomes possible [ reading card attribute information in PC card -32 ]. If CPU11 recognizes it as the card being the thing of ZV port correspondence using card attribute information, it will change the interface logic 179 for card slot 1 from normal mode to ZV port mode.

[0045] [ZV port -- a \*\*\*\*\* [ being usable ] -- decision] -- on the other hand, PC card -32 investigates whether the personal computer side is supporting the ZV port. Specifically, it judges by leading the specific register of the configuration space of the card controller 17. this time -- a ZV port -- if available, the I/O Address to a ZV port will also be read in a register. A register is prepared in configuration space, for example, the reservation part of a PURED I find header, or is prepared in debye SUDI pendant space.

[0046] [Write-in initiation] PC card -32 starts the I/O (burst) light transaction which followed the usual protocol of PC card -32 to the I/O Address for ZV ports. The I/O Address specified by this transaction is outputted to PCI bus 2 by the card controller 17.

[0047] The [setting of display controller] display controller 14 prepares for the data reception through ZV port 4, after decoding the above-mentioned I/O Address. Specifically, the change of an I/O buffer etc. is performed.

[0048] After [actuation of card controller] card controller 17 decodes the above-mentioned I/O Address, it switches some buses of PC card -32 to a ZV port 4 side by the 1 switching circuit 175, and transmits the video data of PC card -32 to a display controller 14 directly with the ZV bridge 174 for PC cards -32. At this time, the signal line to switch is as drawing 5 having explained.

2) If switching is completed, the register in which it is shown that ZV port 4 in the card controller 17 is under use will be rewritten, and it will be made a setup in use.

3) While having transmitted the video data to the display controller 14, tell PC card -32 about being during data transfer. That is, FRAME#, IRDY#, and TRDY# are kept asserted and it tells that it is among the burst transmission of an I/O light.

[0049] [Termination of transfer] card controller 17 releases PCI bus 2 to other devices, after the change to ZV port 4 finishes. Specifically FRAME#, IRDY is asserted according to a standard PCI



protocol, and the usual closing (completion) which a master starts is performed.

[0050] [Error termination] When it terminates abnormally by fault having happened to PC card -32 etc., the card controller 17 performs the master abort in the protocol of PC card 32.

[0051] When a device or an operating system besides [forced termination] etc. terminates the transfer by ZV port 4 compulsorily, interruption is applied to the card controller 17. If this interruption is detected, a switching circuit 175 will be used for the controller 190 of the card controller 17, and it will change switching to ZV port 4 to a PCI bus 2 side.

[0052] When the transfer by [rewriting of register] ZV port 4 is completed, in order to show that ZV port 4 is intact, the above-mentioned register of the card controller 17 is rewritten.

[0053] In addition, by ZV port 4, even if the demand of an I/O lead or an I/O light takes place from other devices to the card controller 17 or a display controller 14 during data transfer, the card controller 17 or a display controller 14 does not assert TRDY#. Namely, the card controller 17 and two devices of a display controller 14 seem to be under use in other devices.

[0054] Moreover, also when PC card -16 is connected, a video data etc. is sent to the direct display controller 14 by a switching circuit 175 and the ZV bridge 173 for PC cards -16.

[0055] As mentioned above, in the system of this operation gestalt, although the pins to which video / audio signal line is assigned differ with PC card -16 and PC card -32, two ZV bridges, the object for PC cards -16 and the object for PC card-32, 173,174 are formed, and they are suitably changed by the switching circuit 175. For this reason, even when which of PC card -16 and PC card -32 is connected to a card slot, the video audio data from that connected PC card can be normally transmitted to ZV port 4.

[0056] Moreover, in this system, PC card -16, PC card -32, etc. which were realized as a video conference system besides PC card -16 which carries out a capture to a personal computer, and PC card -32, or an MPEG decoder (MPEG1 or MPEG 2 correspondence) can use a video signal similarly.

[0057]

[Effect of the Invention] As explained above, according to this invention, even when which of a 16-bit PC card and a 32-bit PC card is connected to a card slot, it can be normally connected to an animation dedicated bus, and it becomes possible to use effectively the pass band width of face by the type of a PC card expanded by the animation dedicated bus \*\*.

---

[Translation done.]

## DESCRIPTION OF DRAWINGS

---

### [Brief Description of the Drawings]

[Drawing 1] The block diagram showing the configuration of the computer system concerning 1 operation gestalt of this invention.

[Drawing 2] Drawing showing the correspondence relation of pin assignment between PC card -16 and PC card -32 used by the system of this operation gestalt.

[Drawing 3] Drawing showing the correspondence relation of pin assignment between PC card -16 and PC card -32 used by the system of this operation gestalt.

[Drawing 4] Drawing showing the PC card interface in the normal mode of PC card -16 used by the system of this operation gestalt, and each ZV port mode.

[Drawing 5] Drawing showing the PC card interface in the normal mode of PC card -32 used by the system of this operation gestalt, and each ZV port mode.

[Drawing 6] The block diagram showing an example of the concrete configuration of the PC card controller in the system of this operation gestalt.

### [Description of Notations]

2 [ — CPU, 12 / — A host-PCI bridge 13 / — Memory, 14 / — A display controller, 17 / — A PC card controller, 21 / — An audio controller, 171 / — The controller for PC cards -16, 172 / — The interface for PC cards -32, 173 / — ZV bridge for PC cards -16, 174 / — ZV bridge for PC cards -32, 175 / — Switching circuit. ] — An internal PCI bus, 3 — An internal ISA Bus, 4 — A ZV port, 11

Fig. 1

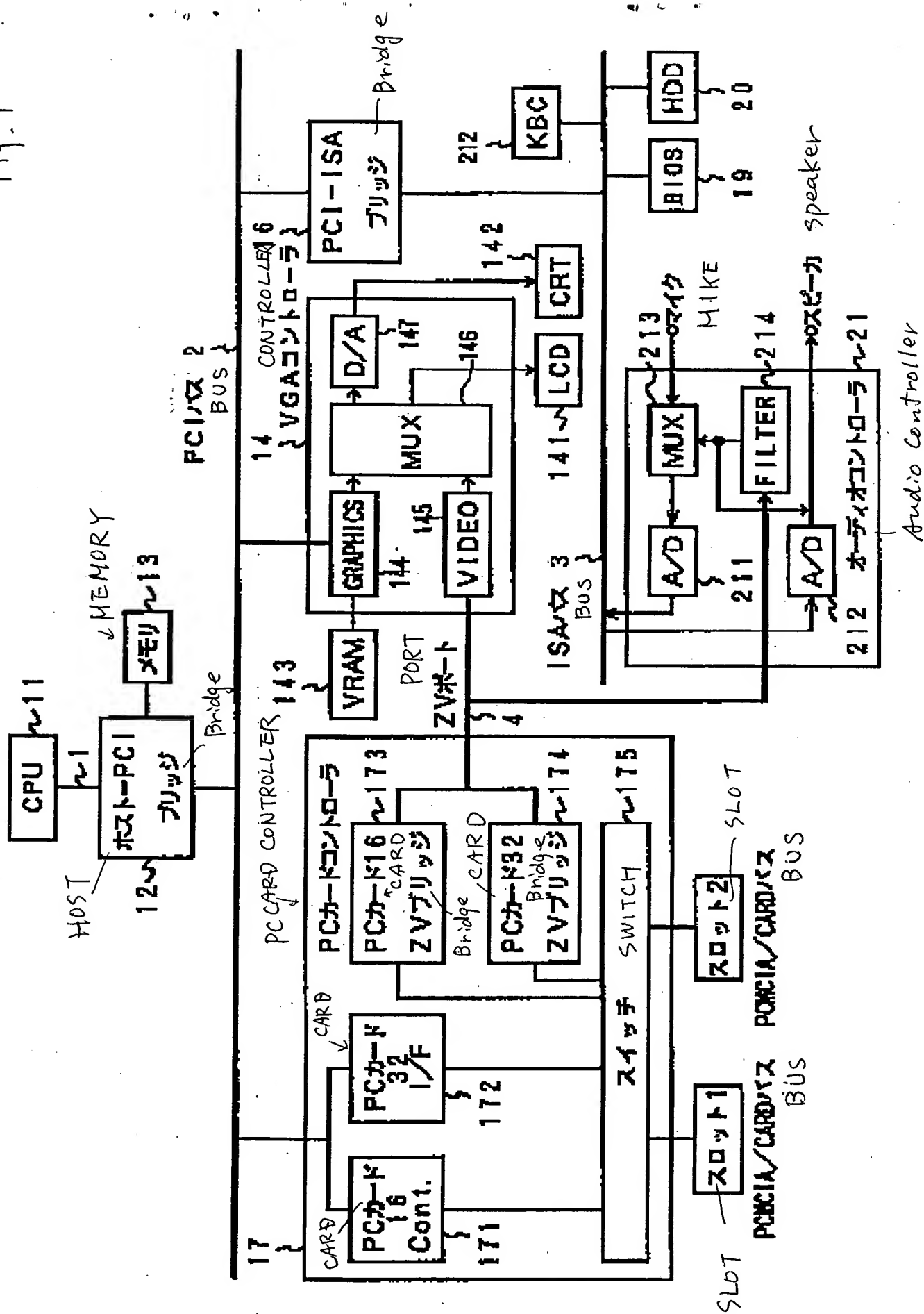


Fig. 2

PC Card Pin 1 to Pin 34

Pin	16-bit PC Card Interface				CardBus PC Card Interface	
	Memory-Only		I/O and d Memory		Signal	
	Signal	I/O	Signal	I/O		
1	GND	DC	GND	DC	GND	DC
2	D3	I/O	D3	I/O	CAD0	I/O
3	D4	I/O	D4	I/O	CAD1	I/O
4	D5	I/O	D5	I/O	CAD3	I/O
5	D6	I/O	D6	I/O	CAD5	I/O
6	D7	I/O	D7	I/O	CAD7	I/O
7	CE1#	I	CE1#	I	CCBE0#	I/O
8	A10	I	A10	I	CAD9	I/O
9	OE#	I	OE#	I	CAD11	I/O
10	A11	I	A11	I	CAD12	I/O
11	A9	I	A9	I	CAD14	I/O
12	A8	I	A8	I	CCBE1#	I/O
13	A13	I	A13	I	CPAR	I/O
14	A14	I	A14	I	CPERR#	I/O
15	WE#	I	WE#	I	CGNT#	I
16	READY	O	IREQ#	O	CINT#	O
17	Vcc	DCin	Vcc	DCin	Vcc	DCin
18	Vpp1	DCin	Vpp1	DCin	Vpp1	DCin
19	A16	I	A16	I	CCLK	I
20	A15	I	A15	I	CIRDY#	I/O
21	A12	I	A12	I	CCBE2#	I/O
22	A7	I	A7	I	CAD18	I/O
23	A6	I	A6	I	CAD20	I/O
24	A5	I	A5	I	CAD21	I/O
25	A4	I	A4	I	CAD22	I/O
26	A3	I	A3	I	CAD23	I/O
27	A2	I	A2	I	CAD24	I/O
28	A1	I	A1	I	CAD25	I/O
29	A0	I	A0	I	CAD26	I/O
30	D0	I/O	D0	I/O	CAD27	I/O
31	D1	I/O	D1	I/O	CAD29	I/O
32	D2	I/O	D2	I/O	RFU	
33	WP	O	IOIS16#	O	CCLKRUN#	I/O
34	GND	DC	GND	DC	GND	DC

Fig. 3

PC Card Pin 35 to Pin 68

Pin	16-bit PC Card Interface				CardBus PC	
	Memory-Only		I/O and d Memory		Card Interface	
	Signal	I/O	Signal	I/O	Signal	I/O
35	GND	DC	GND	DC	GND	DC
36	CD1#	0	CD1#	0	CCD1#	0
37	D11	I/O	D11	I/O	CAD2	I/O
38	D12	I/O	D12	I/O	CAD4	I/O
39	D13	I/O	D13	I/O	CAD6	I/O
40	D14	I/O	D14	I/O	RFU	
41	D15	I/O	D15	I/O	CAD8	I/O
42	CE2#	I	CE2#	I	CAD10	I/O
43	VS1#	0	VS1#	0	CVS1	I/O
44	RFU		IORD#	I	CAD13	I/O
45	RFU		IOWR#	I	CAD15	I/O
46	A17	I	A17	I	CAD16	I/O
47	A18	I	A18	I	RFU	
48	A19	I	A19	I	CBLOCK#	I/O
49	A20	I	A20	I	CSTOP#	I/O
50	A21	I	A21	I	CDEVSEL#	I/O
51	Vcc	DCin	Vcc	DCin	Vcc	DCin
52	Vpp2	DCin	Vpp2		Vpp2	DCin
53	A22	I	A22	I	CTRDY#	I/O
54	A23	I	A23	I	CFRAME#	I/O
55	A24	I	A24	I	CAD17	I/O
56	A25	I	A25	I	CAD19	I/O
57	VS2#		VS2#		CVS2	I/O
58	RESET	I	RESET	I	CRST#	I
59	WAIT#	0	WAIT#	0	CSERR#	0
60	RFU		INPACK#	0	CREQ#	0
61	REG#	I	REG#	I	CCBE3#	I/O
62	BVD2	0	SPKR#	0	CAUDIO	0
63	BVD1	0	STSCHG#	0	CSTSCHG	0
64	D8	I/O	D8	I/O	CAD28	I/O
65	D9	I/O	D9	I/O	CAD30	I/O
66	D10	I/O	D10	I/O	CAD31	I/O
67	CD2#	0	CD2#	0	CCD2#	0
68	GND	DC	GND	DC	GND	DC

Fig. 4

PC Card Pin 番号(No.)	PCCARD 16 PCカード-16	ZV Port Mode
8	A10	HREF
10	A11	VSYNC
11	A9	Y0
12	A8	Y2
13	A13	Y4
14	A14	Y6
19	A16	UV2
20	A15	UV4
21	A12	UV6
22	A7	SCLK
23	A6	MCLK
24::25	A (5::4)	RESERVED
26::29	A (3::0)	ADDRESS (3::0)
33	IOIS16#	PCLK
46	A17	Y1
47	A18	Y3
48	A19	Y5
49	A20	Y7
50	A21	UV0
53	A22	UV1
54	A23	UV3
55	A24	UV5
56	A25	UV7
60	INPACK#	LRCLK
62	BVD2/SPKR#	SDATA

PIN No.

ZV PORT MODE

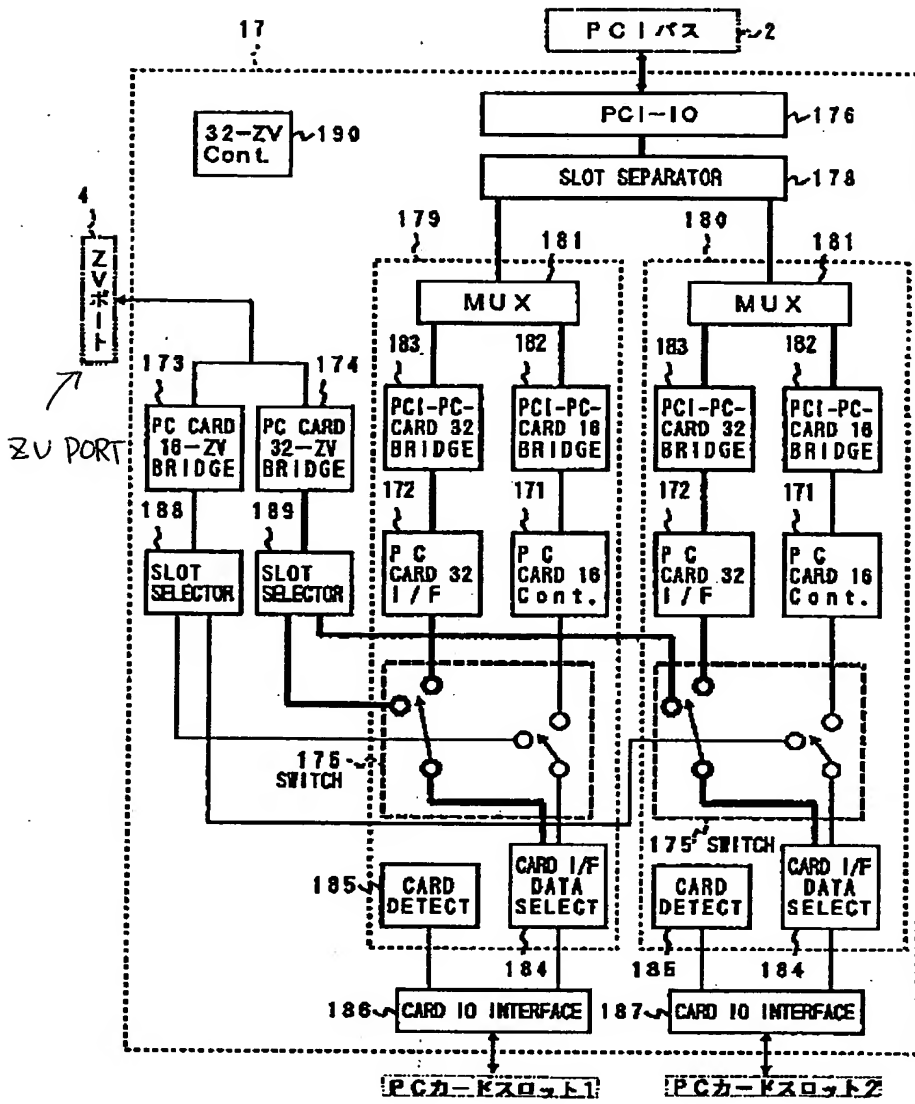
Fig. 5

PIN番号	PC Card-32	ZVポートモード
2	CAD0	Y0
3	CAD1	Y2
4	CAD3	Y4
5	CAD5	Y6
6	CAD7	Y7
8	CAD9	UV2
9	CAD11	UV3
10	CAD12	UV5
11	CAD14	UV7
22, 23	CAD18, 20	Reserved
24	CAD21	SCLK
25	CAD22	MCLK
30	CAD27	LRCLK
31	CAD29	SDATA
37	CAD2	Y1
38	CAD4	Y3
39	CAD6	Y5
41	CAD8	UV0
42	CAD10	UV1
44	CAD13	UV4
45	CAD15	UV6
55	CAD17	HREF
56	CAD19	VSYNC
66	CAD31	PCLK



# PCI BUS

Fig. 6



PC CARD SLOT 1

PC CARD SLOT 2

## \* NOTICES \*

JPO and NCIP are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.

2. \*\*\*\* shows the word which can not be translated.

3. In the drawings, any words are not translated.

---

CORRECTION OR AMENDMENT

---

[Kind of official gazette] Printing of amendment by the convention of 2 of Article 17 of Patent Law

[Section partition] The 3rd partition of the 6th section

[Publication date] February 28, Heisei 14 (2002. 2.28)

[Publication No.] JP,9-134240,A

[Date of Publication] May 20, Heisei 9 (1997. 5.20)

[Annual volume number] Open patent official report 9-1343

[Application number] Japanese Patent Application No. 7-289873

[The 7th edition of International Patent Classification]

G06F 3/00  
13/14 330  
G06K 17/00

[FI]

G06F 3/00 F  
13/14 330 C  
G06K 17/00 C

[Procedure revision]

[Filing Date] August 20, Heisei 13 (2001. 8.20)

[Procedure amendment 1]

[Document to be Amended] Specification

[Item(s) to be Amended] Claim

[Method of Amendment] Modification

[Proposed Amendment]

[Claim(s)]

[Claim 1] A 16-bit PC card and a 32-bit PC card are the card slot which can connect alternatively,

The card controller which controls said 16-bit PC card or 32-bit PC card which was connected to the system bus and connected to said card slot,

With the display controller who is connected to a system bus and has the display process function of a video data

The audio controller which is connected to a system bus and carries out input/output control of the speech information,

The video audio bus arranged between said card controller and said display controller, and the audio controller,

The 1st connecting means which connects the video / audio signal track group assigned to predetermined two or more pins of said 16-bit PC card respectively corresponding to the video / audio signal line of said video audio bus,

The 2nd connecting means which connects the video / audio signal track group assigned to predetermined two or more pins of said 32-bit PC card respectively corresponding to the video / audio signal line of said video audio bus,

The computer system characterized by providing the connection control means which controls connection between said PC card and said video audio bus, using alternatively said 1st and 2nd connecting means according to any of said 16-bit PC card and said 32-bit PC card the PC cards connected to said card slot are.

[Claim 2] Said 1st and 2nd connecting means and said connection control means are a computer system according to claim 1 characterized by being built in said card controller.

[Claim 3] A 16-bit PC card and a 32-bit PC card are the card slot which can connect alternatively,

The card controller which controls said 16-bit PC card or 32-bit PC card which was connected to the system bus and connected to said card slot,

With the display controller who is connected to a system bus and has the display process function of a video data

The audio controller which is connected to a system bus and carries out input/output control of the speech information,

The video audio bus arranged between said card controller and said display controller, and the audio controller is provided,

Said card controller,

The 1st connecting means which connects the video / audio signal track group which was the 1st connecting means which connects said 16-bit PC card to said system bus and said video audio bus alternatively, and was assigned to predetermined two or more pins of said 16-bit PC card when connecting with said video audio bus respectively corresponding to the video / audio signal line of said video audio bus,

The 2nd connecting means which connects the video / audio signal track group which was the 1st connecting means which connects said 32-bit PC card to said system bus and said video audio bus alternatively, and was assigned to predetermined two or more pins of said 32-bit PC card when connecting with said video audio bus respectively corresponding to the video / audio signal line of said video audio bus,

According to any of said 16-bit PC card and said 32-bit PC card the PC cards connected to said card slot are, the connection control means which controls connection with said PC card and said system bus, and a video audio bus, using alternatively said 1st and 2nd connecting means is included,

Said connection control means is a computer system characterized by changing connection of said 32-bit PC card from said system bus to said video audio bus according to the address value specified by the light transaction performed by said 32-bit PC card.

[Claim 4] In the card controller which controls the PC card by which the 16-bit PC card and the 32-bit PC card were alternatively connected to the card slot which can connect,

The video audio bus for connecting directly to a display controller and an audio controller the PC card connected to said card slot,

The 1st connecting means which connects the video / audio signal track group assigned to predetermined two or more pins of said 16-bit PC card respectively corresponding to the video / audio signal line of said video audio bus,

The 2nd connecting means which connects the video / audio signal track group assigned to predetermined two or more pins of said 32-bit PC card respectively corresponding to the video / audio signal line of said video audio bus,

The PC card controller characterized by providing the connection control means which controls connection between said PC card and said video audio bus, using alternatively said 1st and 2nd connecting means according to any of said 16-bit PC card and said 32-bit PC card the PC cards connected to said card slot are.

[Claim 5] In a 32-bit PC card connectable with the card slot of the computer which has a video audio bus for connecting to a display controller and an audio controller directly the PC card connected to the card slot,

The 32-bit PC card characterized by sending data to said video audio bus by assigning predetermined two or more pins in the pin group for a host interface prepared in said 32-bit PC card to said video audio bus as a video audio pin for carrying out data output, and carrying out data output through the video audio pin.

[Claim 6] A 16-bit PC card and a 32-bit PC card are the card slot which can connect alternatively,

The card controller which controls said 16-bit PC card or 32-bit PC card which was connected to the system bus and connected to said card slot,

With the display controller who is connected to a system bus and has the display process function of a video data

The audio controller which is connected to a system bus and carries out input/output control of the speech information,

The video audio bus arranged between said card controller and said display controller, and the audio controller,

A decision means to judge which [ of said 16 bit PC card and said 32 bit PC card ] was inserted in said card slot,

The computer system characterized by providing the connecting means which connects the video / audio signal track group assigned to predetermined two or more pins of said 16-bit PC card, or the video / audio signal track group assigned to predetermined two or more pins of said 32-bit PC card respectively corresponding to the video / audio signal line of said video audio bus according to said decision means.

[Procedure amendment 2]

[Document to be Amended] Specification

[Item(s) to be Amended] 0006

[Method of Amendment] Modification

[Proposed Amendment]

[0006]

[Means for Solving the Problem] This invention is characterized by providing the following in a computer system. A 16-bit PC card and a 32-bit PC card are the card slot which can connect alternatively. The card controller which controls said 16-bit PC card or 32-bit PC card which was connected to the system bus and connected to said card slot The display controller who is connected to a system bus and has the display process function of a video data The audio controller which is connected to a system bus and carries out input/output control of the speech information, The video audio bus arranged between said card controller and said display controller, and the audio controller, The 1st connecting means which connects the video / audio signal track group assigned to predetermined two or more pins of said 16-bit PC card respectively corresponding to the video / audio signal line of said video audio bus, The 2nd connecting means which connects the video / audio signal track group assigned to predetermined two or more pins of said 32-bit PC card respectively corresponding to the video / audio signal line of said video audio bus, The connection control means which controls connection between said PC card and said video audio bus according to any of said 16-bit PC card and said 32-bit PC card the PC cards connected to said card slot are, using alternatively said 1st and 2nd connecting means